hypochondrogenesis

Hypochondrogenesis is a rare, severe disorder of bone growth. This condition is characterized by a small body, short limbs, and abnormal bone formation (ossification) in the spine and pelvis.

Affected infants have short arms and legs, a small chest with short ribs, and underdeveloped lungs. Bones in the skull develop normally, but the bones of the spine (vertebrae) and pelvis do not harden (ossify) properly. The face appears flat and oval-shaped, with widely spaced eyes, a small chin, and, in some cases, an opening in the roof of the mouth called a cleft palate. Individuals with hypochondrogenesis have an enlarged abdomen and may have a condition called hydrops fetalis in which excess fluid builds up in the body before birth.

As a result of these serious health problems, some affected fetuses do not survive to term. Infants born with hypochondrogenesis usually die at birth or shortly thereafter from respiratory failure. Babies who live past the newborn period are usually reclassified as having spondyloepiphyseal dysplasia congenita, a related but milder disorder that similarly affects bone development.

Frequency

Hypochondrogenesis and achondrogenesis, type 2 (a similar skeletal disorder) together affect 1 in 40,000 to 60,000 newborns.

Genetic Changes

Hypochondrogenesis is one of the most severe conditions in a spectrum of disorders caused by mutations in the *COL2A1* gene. This gene provides instructions for making a protein that forms type II collagen. This type of collagen is found mostly in the clear gel that fills the eyeball (the vitreous) and in cartilage. Cartilage is a tough, flexible tissue that makes up much of the skeleton during early development. Most cartilage is later converted to bone, except for the cartilage that continues to cover and protect the ends of bones and is present in the nose and external ears. Type II collagen is essential for the normal development of bones and other connective tissues that form the body's supportive framework. Mutations in the *COL2A1* gene interfere with the assembly of type II collagen molecules, which prevents bones and other connective tissues from developing properly.

Inheritance Pattern

Hypochondrogenesis is considered an autosomal dominant disorder because one copy of the altered gene in each cell is sufficient to cause the condition. It is caused by new

mutations in the *COL2A1* gene and occurs in people with no history of the disorder in their family. This condition is not passed on to the next generation because affected individuals do not live long enough to have children.

Other Names for This Condition

- achondrogenesis type II/hypochondrogenesis

Diagnosis & Management

These resources address the diagnosis or management of hypochondrogenesis:

- Genetic Testing Registry: Hypochondrogenesis
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0542428/
- MedlinePlus Encyclopedia: Achondrogenesis
  https://medlineplus.gov/ency/article/001247.htm

These resources from MedlinePlus offer information about the diagnosis and management of various health conditions:

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html

Additional Information & Resources

MedlinePlus

- Encyclopedia: Achondrogenesis
  https://medlineplus.gov/ency/article/001247.htm
- Health Topic: Connective Tissue Disorders
  https://medlineplus.gov/connectivetissuedisorders.html
- Health Topic: Dwarfism
  https://medlineplus.gov/dwarfism.html

Additional NIH Resources

- National Institute of Arthritis and Musculoskeletal and Skin Diseases
  https://www.niams.nih.gov/Health_Info/Connective_Tissue/

Educational Resources

- MalaCards: hypochondrogenesis
  http://www.malacards.org/card/hypochondrogenesis
- Nemours Children's Health System: Skeletal Dysplasia
  http://www.nemours.org/service/medical/skeletal-dysplasia.html?tab=about
- Orphanet: Achondrogenesis
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=932

Patient Support and Advocacy Resources

- Cleft Palate Foundation
  http://www.cleftline.org/
- Human Growth Foundation
  http://hgfound.org/
- International Skeletal Dysplasia Registry, UCLA
  http://ortho.ucla.edu/isdr
- Little People of America
  http://www.lpaonline.org
- National Organization for Rare Disorders (NORD)
  https://rarediseases.org/rare-diseases/achondrogenesis/
- Resource list from the University of Kansas Medical Center
  http://www.kumc.edu/gec/support/dwarfism.html
- The MAGIC Foundation
  https://www.magicfoundation.org/

Genetic Testing Registry

- Achondrogenesis, type II
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0220685/
- Hypochondrogenesis
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0542428/

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28hypochondrogenesis%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D

OMIM

- ACHONDROGENESIS, TYPE II
  http://omim.org/entry/200610

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